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Notes on the Herpetofauna of Western Mexico 18: Noteworthy Records of Wiegmann's Alligator Lizard, *Gerrhonotus liocephalus* (Wiegmann, 1828), in Jalisco, Mexico . . . . . Aldo Dávalos-Martínez, Daniel Cruz-Sáenz, Sergio Guerrero-Vázquez, Laura López-Fernández, Javier Banda-Leal and David Lazcano 125

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Notes on the Herpetofauna of Western Mexico 18: Noteworthy Records of Wiegmann's Alligator Lizard, *Gerrhonotus liocephalus* (Wiegmann, 1828), in Jalisco, Mexico

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Abstract

We document two new localities for *Gerrhonotus liocephalus* for the state of Jalisco. These records are far from the coastline where the rest of the distribution of this species in Jalisco has been documented. Both records represent latitudinal and altitudinal distributional extensions. The first record is in the municipality of Talpa de Allende and the second in the municipality of Lagos de Moreno.

Resumen

Aquí documentamos dos nuevas localidades para *Gerrhonotus liocephalus* para el estado de Jalisco. Estos registros son lejos de la costa donde el resto de la distribución de esta especie en Jalisco se ha documentado. Ambos registros representan extensiones de distribución latitudinales y altitudinales. El primer registro es en el municipio de Talpa de Allende y el segundo en el municipio de Lagos de Moreno.

Background of the genus

The genus *Gerrhonotus* is a member of the lizard family Anguidae and is endemic to North America. It comprises seven species: *G. farri* Bryson & Graham, 2010; G. *infernalis* Baird, 1859 (1858); *G. liocephalus* Wiegmann, 1828; *G. lazcanoi* Banda-Leal, Nevarez de los Reyes & Bryson, 2017; *G. lugoi* McCoy, 1970; *G. ophiurus* Cope, 1866; and *G. parvus* (Knight & Scudday, 1985). Of these, the most widely distributed is *G. liocephalus*. This species is endemic to Mexico and its distribution includes the Pacific Coast and Central Plateau regions (Cruz-Sáenz et al., 2017), extending from Sinaloa southward to Chiapas, along the Pacific coastal plain, according to Ochoa-Ochoa et al. (2006), who mapped the potential distribution of various Mexican herpetofaunal species. *Gerrhonotus infernalis* occurs in central and northern Mexico and southern Texas (Good, 1994). The rest of the species are found in restricted areas and are known from only a few individuals. *Gerrhonotus ophiurus* is distributed in central and southwestern San Luis Potosí, Tamaulipas, eastern Querétaro, Hidalgo, Tlaxcala, Puebla, and mountainous areas of northern Veracruz (Lemos-Espinal and Dixon, 2013); *G. lugoi* is isolated in the Cuatro Ciénegas Basin of Coahuila (McCoy, 1970), with the exception of a recently recorded specimen in the municipality of Mina, Nuevo León (García-Vazquez et al., 2016); *G. farri* is found near the town of Tula, Tamaulipas (Bryson and Graham, 2010); and *G. parvus* is known only from the state of Nuevo León, in the municipalities of Galeana, Los Rayones, Santa Catarina, and Santiago (Banda-Leal et al., 2013; Banda-Leal et al., 2014b). The last four species have a limited distribution and very little is known about their biology. In the case of *G. lugoi*, there is a report of reproduction in captivity that also describes courtship and litter size (Lazcano et al., 1993). For *G. parvus*, there is more detailed information about its natural history (Bryson et al., 2003), as well as its distribution, litter size, sympatric herpetofauna, and potential predators (Banda-Leal et al., 2013; Banda-Leal et al., 2014a, b; Banda-Leal, 2016). *Gerrhonotus farri* and *G. lazcanoi* are known from a single specimen each (Bryson and Graham, 2010; Banda-Leal et al., 2017). *Gerrhonotus liocephalus* is exceptional among the species of this genus endemic to Mexico, insofar as it has a broad range from the coast of Jalisco to northern Guerrero, as well as Oaxaca to Chiapas, with a relict population in southwestern Durango (Webb and Hensley, 1959).

Background of the species

Individuals of *Gerrhonotus liocephalus* have an elongate body with short limbs and a very long tail in relation to the length of the body, giving them the appearance of a snake at first glance. They are medium-sized lizards, reaching about 142 mm snout–vent length. The head is triangular in shape and is wider than the body. As with most representatives of the family Anguidae, this species has a series of granular scales located between the dorsal and ventral scales, which forms a dermal fold (= lateral fold). The general color is yellowish brown dorsally, with a pattern of white and dark brown spots forming a few lines in "V" form along the body and tail; ventrally they are drab gray; the head is yellowish-brown and limbs have dark spots dorsally. This species is oviparous, of diurnal habits, riparian, fossorial, and insectivorous like most other members of the genus (García and Ceballos, 1994).

Habitat use

Gerrhonotus liocephalus inhabits many vegetation communi-

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ties, including tropical subdeciduous and deciduous forest, pine-oak forest, and riparian vegetation. They are arboreal, but can be found active on the ground or camouflaged among the leaf litter. Concerning its conservation and protection status, this species is protected by the Mexican environmental law as "Pr" (special protection), is considered as "LC" (Least Concern) by the IUCN species list, and has a low value of Environmental Vulnerability Score (Wilson et al., 2013).

Study sites

Talpa de Allende: This municipality covers an area of 2685.02 km² and lies within the Sierra Jaliciense physiographic region (INEGI 1990, 2005). It is located in the northwestern portion of the state of Jalisco, with geographical limits (20°22' 50" N; 104°49' 19" W) and an altitudinal gradient between 1130 and 1510 m. The climate is characterized by semi-humid springs, semi-dry winters and temperatures between 13.2 and 29.5°C (INAFED, 2001). The study site lies within the "Parque Estatal Bosque de Arce" with an area of 150.04 ha, with montane mesophilic forest, and where a relict maple forest is found containing the following dominant species: *Acer saccharum* (Sugar Maple / *Arce Azucarero*); *Acer skutchii* (Skutch's Maple / *Alamo Plateado*); *Podocarpus reichei* (Black Cedar / *Cedro Prieto*); *Matudaea trinervia* (Broken Arrow / *Naranjillo*); *Magnolia pacifica*; *Cyathea costaricensis* (Costa Rican Tree Fern / *Helecho Arborescente*); *Pinus oocarpa* (Egg-cone Pine / *Ocote*) (Vázquez-Hernández et al., 1999). This site has recently been declared a natural protected area receiving the official name of Parque Estatal Bosque de Arce (Anonymous, 2016).

Lagos de Moreno: This municipality has an area of 2648.22 km², and is encompassed within the Central Plateau physiographic region. It is located in the northeastern portion of Jalisco, with geographical limits of 21°21'00" N; 101°55' 00" W, WGS84 and an altitudinal gradient between 1800 and 2870 m. The climate is semi-dry and semi-warm, and temperatures vary between 5.4 and 28.5°C (INAFED, 2001). The vegetation types of this region are represented by tropical subdeciduous and deciduous forest, thorn scrub forest, pine-oak forest, xerophilous scrub, and grassland (INEGI, 1981; Cruz-Sáenz, et al., 2017). Our collecting site was in the Sierra de Lobos; this sierra extends into the municipality of León, Guanajuato, which is located between the high Guanajuatense flanks in Jalisco and the Sierra de Guanajuato. This region is bordered to the north by the municipalities of San Felipe and Lagos de Moreno (our collecting municipality), Jalisco, and to the south by the municipalities of San Francisco de el Rincón and Romita in Guanajuato, to the east by the municipalities of Guanajuato and Silao, and to the west by the municipalities of Purísima del Rincón and Unión de San Antonio Jalisco (Anonymous, 2012). This natural protected area known as Sierra de Lobos has an area of 127,058.06 ha, and an altitudinal gradient between 1900 and 2800 m. The vegetation types present in this protected area consist of tropical deciduous forest, thorn scrub forest, xerophilous scrub, grassland, and pine-oak forest, with the following dominant plant species: *Bursera fagaroides* (Torchwood Copal / *Cuajiote*); *Eysenhardtia polystachia* (Kidneywood / *Palo Dulce*); *Quercus* sp. (Oak / *Encino*). (INEGI, 1981; Cruz-Sáenz, et al., 2017).

Figure 1. A young forest of *Acer saccharum* in the study site in the municipality of Talpa de Allende, Jalisco. Photograph by Daniel Cruz Sáenz.

Materials and Methods

While sampling for mammals, principally bats, in various vegetation communities in the municipality of Talpa de Allende in August of 2016, and sampling for a specific population of *Pinus cembroides* (Pinyon Pine / *Piñonero*) in Lagos de Moreno in September of 2016, we sighted two specimens of *Gerrhonotus liocephalus*. Below we describe our findings.

Results

We document two new records of *Gerrhonotus liocephalus*

Figure 2. A young forest of *Pinus oocarpa* in the study site in the municipality of Lagos de Moreno, Jalisco. Photograph by Daniel Cruz Sáenz.

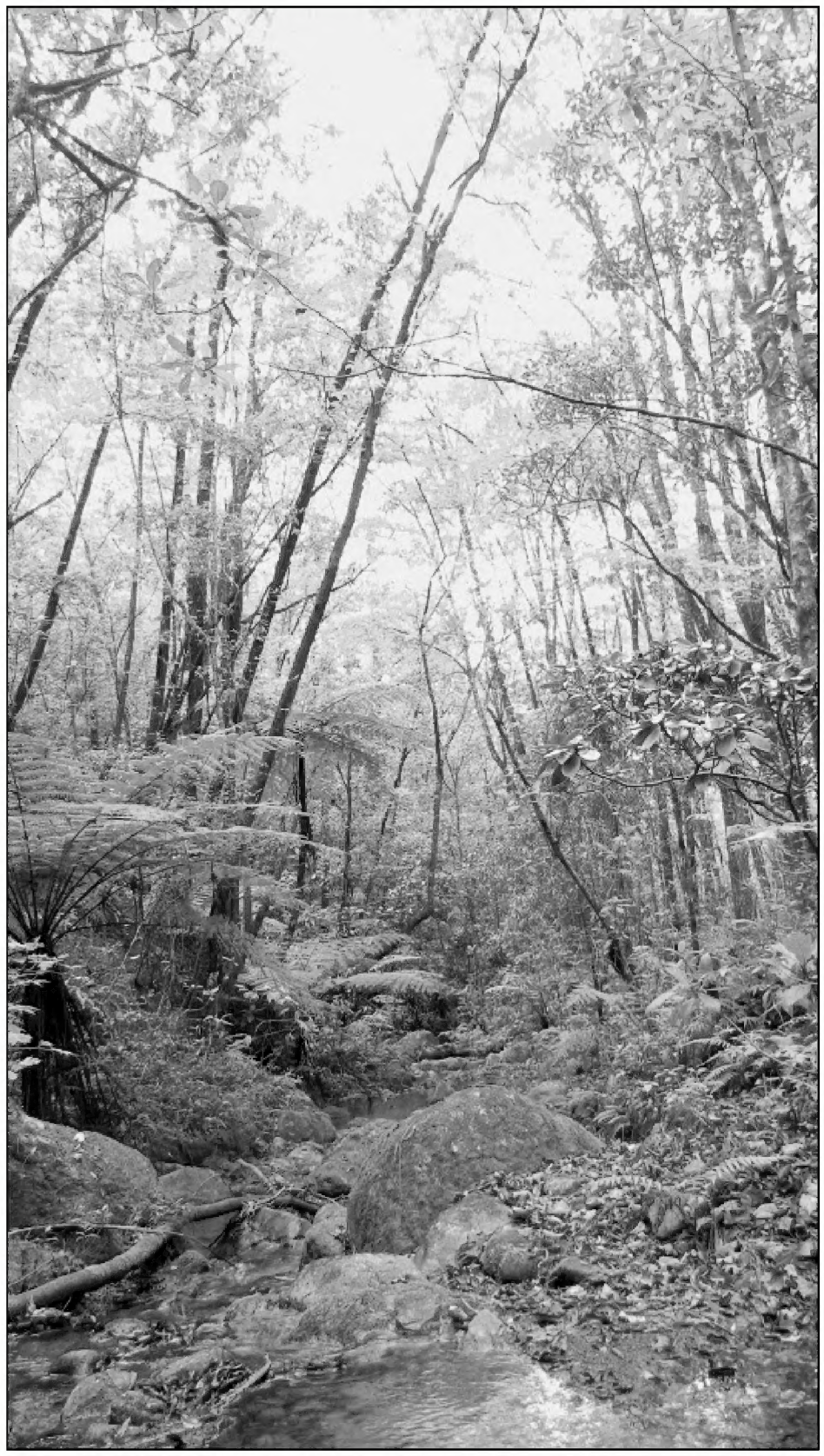


Figure 3. Cañada Ojo de Cuervo, where the first individual was found in the municipality of Talpa de Allende, Jalisco. Photograph by Daniel Cruz Sáenz.

in the state of Jalisco. These records are far from the coastline where the first *G. liocephalus* were recorded for the state. Both records represent latitudinal distribution and elevational extensions. The first record was located in the municipality of Talpa de Allende and the second in Lagos de Moreno. The previous records for Jalisco are from the coastline, but the species has also been documented from southern Aguascalientes (Carbajal-Marquez and Quintero-Diaz, 2016) (see Table 1 and Map).

Specimen from Talpa de Allende

On 25 August 2016 at 18:00 h the first individual, a *G. liocephalus* female, was observed. This individual was active on pine leaves at the following locality (20°12'44"N, 104°45'34"W, WGS84; elevation 1762 m). No morphological characteristics were recorded. The record represents a 64-km extension from the nearest locality on the coastline in the municipality of Chamela, Jalisco (Table 1). This locality is known as Cañada Ojo de Cuervo, and is located within the Parque Estatal Bosque de Arce, a state park where there exists an ecotone pine

Figure 4. *Gerrhonotus liocephalus* found in the municipality of Talpa de Allende, Jalisco. Photograph by Sergio Guerrero-Vázquez.

forest-montane mesophilic forest-tropical subdeciduous and deciduous forest. Cañada Ojo de Cuervo is a state natural protected area, with a unique floristic composition; but there is no information about its faunal composition, which is why we conducted this study. Our observations were made at the entrance to the cañada where there is a pine forest with the following dominant plant species: *Pinus oocarpa*; *Quercus gentryi* (Red Oak / *Encino Avellano*)*; Clethra hartwegii* (Sweet Pepperbush */ Jaboncito*); *Cercocarpus macrophyllus* (Mountain Mahogany / *Caoba de Montaña*). This locality is also the highest elevation in the municipality. The specimen was photographed and released in situ (Figure 4).

Specimen from Lagos de Moreno

On 24 September 2016 at 16:00 h, the second specimen of *G. liocephalus*, a male was found inactive under a rock on a dirt road that branched off the federal highway 80D Lagos de Moreno-San Luis Potosí, about 5.4 km from the urban area of Lagos de Moreno, Jalisco (21°29'02.7"N, 101°41'42.2"W, WGS84, elevation 2455 m). At this site, we took morphological data on the lizard, as follows: snout–vent length 121 mm; tail length 101 mm; total length 222 mm; head length 24 mm; and head width 15 mm. The record represents a 412.57-km extension from the nearest locality on the coastline in the municipality of Chamela, Jalisco (Table 1). The vegetation type at the locality where the specimen was found is an ecotone of tropical dry forest and pine-oak forest. Dominant plant species in the area are *Bursera fagaroides*, *Eysenhardtia polystachia* and *Quercus* sp. The specimen was photographed and released in situ. (Figure 5). Our observations were made in a pine forest

Figure 5. *Gerrhonotus liocephalus* found in the municipality of Lagos de Moreno, Jalisco. Photograph by Aldo Dávalos-Mártinez.

Table 1. Localities for *Gerrhonotus liocephalus* in the region.

State	Municipality	Locality	Elevation (m)
Jalisco (new)	Lagos de Moreno	Sierra de Lobos (21°29'02.7"N, 101°41'42.2"W)	2455
Aguascalientes	Aguascalientes	El Ocote (21°47'15.34"N, 102°33'40.97"W)	1938
Aguascalientes	San José de Gracia	Estación Biológica Aguas Zarca (22°05'33.87"N, 102°33'20.07"W)	2147
Aguascalientes	Calvillo	Los Alisos (21°58'01.2"N, 102°45'00.2"W)	2034
Jalisco	Villa Hidalgo	Cerro La Cuchilla (21°44'10.96" N, 102°41'6.07W)	2100
Jalisco (new)	Talpa de Allende	Cañada Ojo de Cuervo (20°12'44 "N, 104°45'34"W)	1762
Jalisco	Chamela-Cuitzmala	La Huerta (19°32'58.5852"N, 105°01'34.7196"W)	742

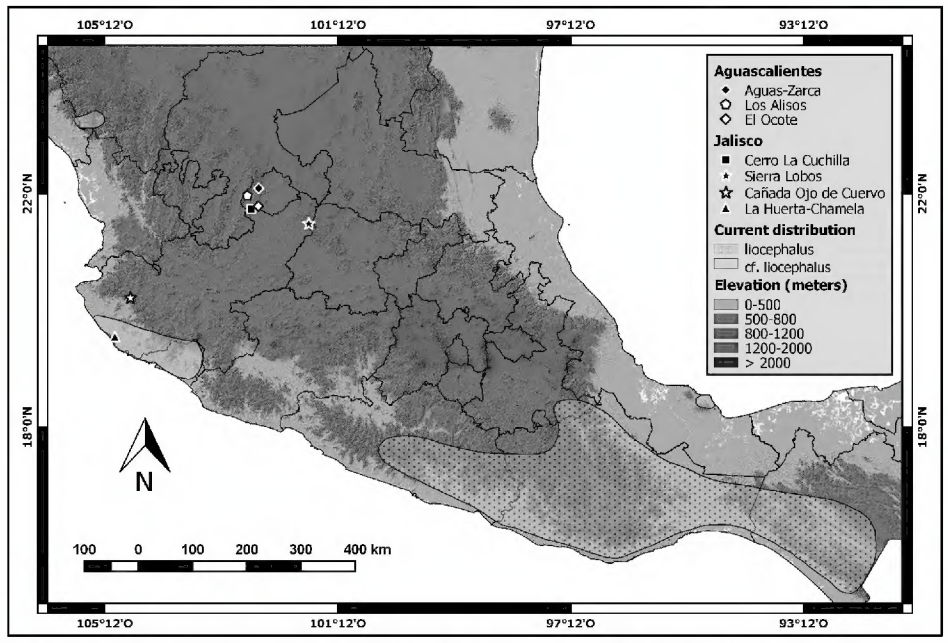
dominated by *Pinus cembroides*.

Discussion and Conclusions

Our results indicate that the first specimen in Talpa de Allende was encountered 64 linear km from the specimen found on the coastal area of Chamela-Cuitzmala. This locality is located within the Sierra Jaliciense physiographic region, which covers 15070.3 km^2 in the foothills and highlands lying east of the Pacific Coastal Plain and west of the Trans-Mexican Volcanic Belt, extending from El Tuito and the Sierra del Cuale to the municipalities of Cabo Corrientes, San Sebastian to the west of Talpa de Allende (our study site municipality), and Mascota, to the Sierra de Cacoma and the Sierra de Manantlán. The vegetation is primarily coniferous and oak forests, as well as significant portions of tropical subdeciduous and deciduous forests. Furthermore, this region harbors most of the fragments of montane cloud forest found in Jalisco (Cuevas-Guzman et al., 2010), including two of only five remnant patches of maple forest (*Acer saccharum*) in Mexico, one in Talpa de Allende (our study site municipality) and the other in the Sierra de Manantlán (Vargas-Rodríguez and Platt, 2012). Other floristic elements characteristic of this region are *Cyathea costaricensis*, *Podocarpus reichei*, and the state endemic *Abies jaliscana* (Jalisco Fir / *Pino de Jalisco*).

Our second specimen was found in the Sierra de Lobos, Lagos de Moreno, 413 linear km from the specimens found in the coastal area of Chamela-Cuitzmala. This locality lies in the Central Plateau physiographic region that extends from the northeastern extreme of the state, in the Los Altos Region, to the environs of Lago de Chapala and Laguna de Sayula, bordering most of the Barranca del Río Verde and the eastern margin of the Trans-Mexican Volcanic Belt. This region is the most extensive in the state, with a surface area of 20702.8 km^2. Elevations in this region extend from 1320 m at the westernmost tip in the municipalities of Cocula and San Martín Hidalgo, to 2800 m in the Sierra Alta of Lagos de Moreno (our study site area), and 2950 m at Cerro Viejo, south of the metropolitan area of Guadalajara. The vegetation of this region consists of tropical subdeciduous and deciduous forest, thorn forest, pine-oak forest, xerophilous scrub, and grassland. Aquatic and subaquatic vegetation also is represented in the numerous wetlands in this region, as well as around Lago de Chapala and Laguna de Sayula (INEGI, 1981; Cruz-Sáenz et al., 2017).

The distance between the two localities we are reporting is 348 airline km, which crosses various provinces, including: the Sierra Madre Occidental, Trans-Mexican Volcanic Belt, and a portion of the Sierra Jaliciense, along which line are found a variety of plant communities. The altitude gradient extends from 2455 m (first locality) to 1752 m (second locality). Both localities have some elements of pine forest within them. Even though we have not carried out any modeling of distribution potential for the species in the state, we consider that the species must be present throughout the intermediate area.



Distribution as shown by Good (1994) of *Gerrhonotus liocephalus* (dotted area enclosed by curve) and *Gerrhonotus* cf. *liocephalus* (immaculate area enclosed by curve). Additional records are as follows: **Aguascalientes**: Biological Station Aguas-Zarca (black diamond), Los Alisos (white pentagon) and El Ocote (white diamond). **Jalisco**: Cerro La Cuchilla (black box), Sierra Lobos (black star = new record), Cañada Ojo de Cuervo (white star= new record) and La Huerta-Chamela (black triangle).. Map by Javier Banda-Leal.

Reflections

The areas where we observed *Gerrhonotus liocephalus* are extremely beautiful. If they are not completely protected, however, we will lose (by means of, perhaps, a simple forest fire) forests that have been extant in this region for thousands or perhaps millions of years due to our ignorance of the functioning of these complex plant systems. Our irrational thinking that it all belongs to us is also responsible for this problem. The rate of deforestation suffered by our country is alarming. The accelerated destruction of forests has placed us in a state of emergency, placing a great majority of floral and faunal species that depend on these ecosystems at risk, among them the human species. As our forests disappear, so do the species that inhabit them. The rate of deforestation in Mexico is one of the most intense on the planet. Based on data provided by the Instituto de Geografia UNAM, every year we lose 500,000 hectares of

forests. This puts at risk of extinction a wide variety of endemic plants and animals, as well as many communities which for generations have found in these ecosystems a way of life, to such an extent that they have adapted to take advantage of them without destroying them. This situation also places us in the embarrassing fifth place concerning deforestation around the world. Mexico is one of the most culturally and biologically diverse countries on the planet, and a large part of this biodiversity depends on forests. This richness of natural wealth has allowed many cultures created through the centuries to flourish. Today, it is at risk. Deforestation leads to a drastic reduction in the supply of water at local and national level. Also, it breaks the climatic balance at regional and even global levels, which exacerbates global climate change. In Mexico, the main cause of deforestation is the change of land use to convert forests into pasture or cropland. This practice has been encouraged by all levels of government, which have seen forests and jungles only as idle land, without understanding its multiple benefits nor its vital character. A series of perverse incentives provided by the government has led people to cut their forests in return for economic resources, that at the end leaves the ground prone to erosion. Another factor that threatens the forests is illegal logging, a serious problem in our country, as it is estimated that 70% of the national wood market has an illegal origin. Despite this, Greenpeace believes that we have time to halt this escalation of predation and to ensure the survival of our forests. <http://www.greenpeace.org/mexico/es/Campanas/Bosques/La-deforestacion-y-sus-causas>

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Notes on Reproduction of Great Plains Toads, *Anaxyrus cognatus* (Anura: Bufonidae) from Southern Arizona

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Abstract

I report on a histological examination of gonads from 46 Great Plains Toads, *Anaxyrus cognatus,* from southern Arizona. The smallest mature male (sperm in lumina of seminiferous tubules) measured 50 mm SVL and was from July. The smallest mature female (spawning condition) measured 61 mm SVL and was also from July. *Anaxyrus cognatus* males are capable of breeding from June into September; females are in spawning condition from April to September. *Anaxyrus cognatus* is in a state of reproductive readiness before the start of the summer monsoon and a portion of the population is capable of reproduction in August and September. Postovulatory follicles (evidence of recent spawning) are documented as occurring in *A. cognatus*.

Anaxyrus cognatus Say, 1823, ranges from southern Canada to San Luis Potosí, Mexico, west Texas to southeastern California and southern Nevada (Stebbins, 2003). The biology of *A. cognatus* (as *Bufo cognatus*) is summarized in Krupa (1990) and Graves and Krupa (2005). *Anaxyrus cognatus* (as *Bufo cognatus*) breeds explosively after summer rainstorms (Sullivan, 1983). The duration of *A. cognatus* breeding lasted 2.6 days for 10 breeding aggregations (Sullivan, 1985). In this paper I present data from a histological examination of *A. cognatus* gonadal material from southern Arizona. Utilization of museum collections for obtaining reproductive data avoids removing additional animals from the wild.

A sample of 46 *A. cognatus* collected 1954 to 1972 in southern Arizona consisting of 20 adult males (mean snout–vent length, SVL = 65.6 mm ± 6.5 SD, range = 50–73 mm), 21 adult females (mean SVL = 73.2 mm ± 7.1 SD, range = 61–84 mm), one subadult female (SVL = 58 mm) and four unsexed subadults (SVL = 39.5 mm ± 8.3 SD, range = 28–48 mm) was examined from the herpetology collection of the Natural History Museum of Los Angeles County (LACM), Los Angeles, California, USA (Appendix). An unpaired *t*-test was used to test for differences between adult male and female mean SVLs (Instat, vers. 3.0b, Graphpad Software, San Diego, CA).

A small incision was made in the lower part of the abdomen and the left testis was removed from males and a piece of the left ovary from females. Gonads were embedded in paraffin. Sections were cut at 5 μm and stained with Harris' hematoxylin followed by eosin counterstain (Presnell and Schreibman, 1997). Histology slides were deposited at LACM.

The testicular morphology of *A. cognatus* is similar to that of other anurans as described in Ogielska and Bartmańska (2009a). Within the seminiferous tubules, spermatogenesis occurs in cysts which are closed until the late spermatid stage is reached; cysts then open and differentiating sperm reach the lumina of the seminiferous tubules (Ogielska and Bartmańska, 2009a). There were two stages in the testicular cycle of *A. cognatus* (Table 1): Stage 1 "Abundant sperm"—sperm cysts have opened and abundant clusters of sperm fill the seminiferous tubules. A ring of germinal cysts was located on the inner periphery of each seminiferous tubule. Stage 2 "Residual sperm"—sperm limited to only occasional open sperm cysts in lumina of seminiferous tubules; sperm was absent from some seminiferous tubules. The presence of Stage 2 (residual sperm) in 4/12 (33%) of males from August–September indicates that the *A. cognatus* testicular cycle is ending. The smallest mature *A. cognatus* in my study (LACM 115233) contained open sperm cysts, measured 50 mm SVL and was from July. Wright and Wright (1949) reported males of *A. cognatus* (as *Bufo cognatus*) were mature at 47 mm SVL.

Table 1. Two monthly stages in the testicular cycle of 20 adult male *Anaxyrus cognatus* from southern Arizona.

Month	N	Abundant sperm	Residual sperm
June	1	1	0
July	7	6	1
August	5	3	2
September	7	5	2

The mean SVL of *A. cognatus* females was significantly larger than that of males ($t = 3.6$, $df = 39$, $P = 0.001$). The ovarian morphology of *A. cognatus* is similar to that other anurans in being paired organs lying on the ventral sides of the kidneys, which in adults are filled with diplotene oocytes in various stages of development (Ogielska and Bartmańska, 2009b). Mature oocytes are filled with yolk droplets; the layer of surrounding follicular cells is thinly stretched. Two stages were present in the spawning cycle (Table 2): (1) "Ready to spawn"—in which mature oocytes predominated; (2) "Not in spawning condition"—in

Table 2. Two monthly stages in the spawning cycle of 21 adult female *Anaxyrus cognatus* from southern Arizona.

Month	N	Ready to spawn	Not in spawning condition
April	1	1	0
May	1	1	0
June	1	1	0
July	5	5	0
August	7	5	2*
September	6	3	3

* postovulatory follicles, evidence of recent spawning seen in LACM 87443.

Table 3. Months of breeding by state for *Anaxyrus cognatus*.

State	Times of breeding	Source
Alberta	Spring or summer	Russell and Bauer, 2000
Arizona	Spring–Summer	Brennan and Holycross, 2009
California	Not given	Stebbins and McGinnis, 2012
Colorado	May to July	Hammerson, 1999
Iowa	May to mid–July	LeClere, 2013
Kansas	Late March through August	Collins et al., 2010
Minnesota	Mid–May to mid–July	Moriarty and Hall, 2014
Missouri	Mid–March to early June	Johnson, 2000
Montana	Not given	Werner et al., 2004
Nebraska	March–April to August	Ballinger et al., 2010
Nebraska	May to July	Fogell, 2010
New Mexico*	June to September	Degenhardt et al., 1996
Oklahoma	Spring–summer	Bragg, 1940
Oklahoma	March through August	Sievert and Sievert, 2011
South Dakota*	Late spring–early summer	Kiesow, 2006
Texas	April to September	Garrett and Barker, 1987
Texas	May to July	Long, 1987
Texas	March to September	Tipton et al., 2012
Wyoming	Spring–early summer	Baxter and Stone, 1980
Not given	April to September	Wright and Wright, 1949

* may spawn twice per year.

which early diplotene oocytes predominated. The presence of ready to spawn females (Table 2), before commencement of the summer monsoon season indicates a readiness for females to breed as soon as rainfall begins. One female from August (LACM 87443) contained postovulatory follicles (= corpora lutea) remnants from a recent spawning (Redshaw, 1972). Postovulatory follicles form when the ruptured follicle collapses after ovulation; the follicular lumen disappears and proliferating granulosa cells are surrounded by a fibrous capsule (Redshaw, 1972). Postovulatory follicles are short-lived in most anuran species and are resorbed after a few weeks (Redshaw, 1972). The non-spawning females from August (N = 2) and September (N = 3) contained predominantly early diplotene oocytes. Their presence in the August and September samples (Table 2) are an indication that the spawning cycle was concluding for the year. The smallest mature *A. cognatus* in my study (spawning condition) measured 61 mm SVL (LACM 115238) and was from July. Wright and Wright (1949) reported females of *A. cognatus* (as *Bufo cognatus*) were mature at 60 mm SVL.

Varying amounts of atresia were noted in 8/16 (50%) of ready to spawn *A. cognatus* (Table 2). Atresia is a widespread process occurring in the ovaries of all vertebrates (Uribe, 2009). It is the spontaneous digestion of a diplotene oocyte by its own hypertrophied and phagocytic granulosa cells which invade the follicle, and eventually degenerate after accumulating dark pigment (Ogielska and Bartmańska, 2009b); it is common in the amphibian ovary (Saidapur, 1978). Atresia may influence the number of ovulated oocytes (Uribe, 2011) and can remove females from the breeding population (Goldberg, 2017). Incidences of follicular atresia increase late in the reproductive cycle (Goldberg, 1973). Saved energy will presumably be utilized in a subsequent reproduction.

Months of breeding for *A. cognatus* are listed by state in Table 3. In general, they are in accordance with information in Wright and Wright (1949) that breeding occurs from April to September in southern states versus May to July in northern states. My data (Tables 1 and 2) from southern Arizona fits the monthly sequence for southern states in Wright and Wright (1949).

Krupa (1986) provided information of multiple clutch production in *A. cognatus* based on indirect observations. Additional evidence for multiple clutching in *A. cognatus* would come from the presence of postovulatory follicles (previous clutch) and mature oocytes (subsequent spawning) in the same ovary. This was found to occur in *Scaphiopus couchii* by Goldberg (2018). My study has documented the occurrence of postovulatory follicles in *A. cognatus* (LACM 87443) from August, late in the breeding season. Histological examination of additional *A. cognatus* females in spawning condition from earlier in the reproductive season (July) will likely yield evidence on the frequency of multiple spawnings by *A. cognatus*.

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Appendix

Forty-six *Anaxyrus cognatus* examined by county from southern Arizona borrowed from the herpetology collection of the Natural History Museum of Los Angeles County (LACM), Los Angeles, California, USA. **Cochise:** 59380, 87435, 115214, 115215, 115217–115221, 115223–115226, 115228, 115230, 115232–115235, 115245, 123209; **Maricopa:** 8497, 115238, 115239; **Pima:** 64185–64189, 64191, 76348, 76351, 76352, 76504, 87442-87444, 87460, 87461, 87464, 105606, 115241; **Yuma:** 26089, 26090, 87434, 87474.

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What You Missed at the May Meeting: Rob Lovich

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What do bombs and bullets, ships and planes, tanks and Humvees have in common with native animals, endangered species, and wildlife habitat? They are all found on Department of Defense lands. I've met many people over the years since I left the military who are surprised that any DoD agency has a commitment to conservation. Most have no idea that many DoD facilities have full-time biologists. Our May speaker is one of those biologists. Here's the biography of Robert Lovich from our website.

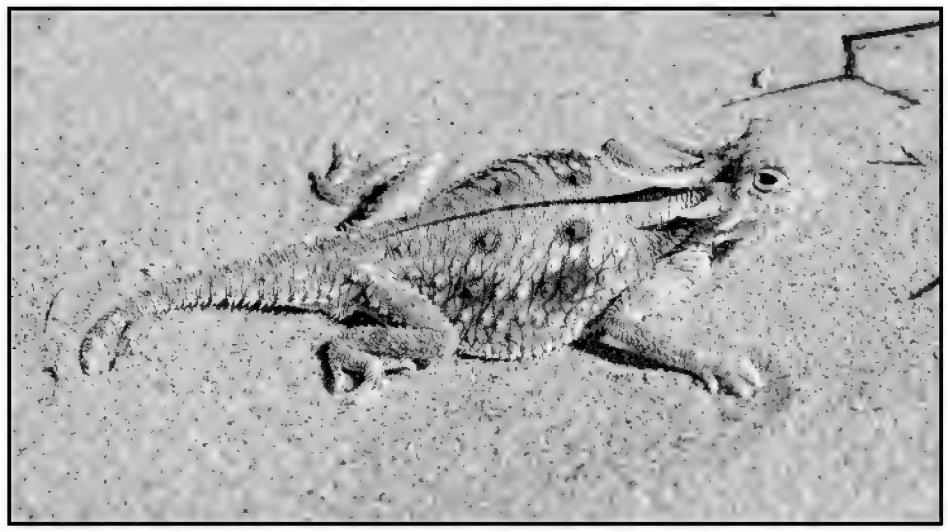
> Robert Lovich is a herpetologist who has been living in southern California for several decades. He has worked in academia, private sector, and also for the federal government. He is presently a Senior Natural Resource Specialist for the U.S. Navy in San Diego, California, and manages projects throughout the Southwest. While his work over the years has included all manner of natural resource issues and species, his passion is amphibians and reptiles and he has been studying them for decades. He is the senior author of the first Strategic Plan for Amphibians and Reptiles for a department of the U.S. government. Active in PARC at large since 2004, he has previously served as the California State Coordinator (2004–2009), been a prior member of the Joint National Steering Committee, Southwest PARC co-chair, and presently serves on the SW PARC steering committee. He has several dozen peer-reviewed publications, and his academic pedigree includes a dissertation on the phylogeography and conservation of the Arroyo Toad (*Anaxyrus californicus*), at Loma Linda University in 2009. His M.S. thesis on the phylogeography of the Granite Night Lizard (*Xantusia henshawi*) was completed in 1999, and resulted in the elevation of the Sandstone Night Lizard (*Xantusia gracilis*) to full species. Robert received his B.S. in Zoology from the University of Hawaii in 1996. In 2009, Robert co-published his first book, "Lizards of the American Southwest" by Larry Jones and Robert Lovich (eds.). Robert serves as Assistant Editor of *Herpetological Conservation and Biology* since 2006, and is a member of the Herpetologists' League Conservation Committee. He is an active member of several herpetological societies, and has been the fortunate recipient of a number of awards. When not working or hanging out with his family, Robert enjoys surfing, golfing, or working on his 1960s Pontiacs.

Rob titled his talk "Amphibian and Reptile Partnerships: Experiences and Successes." His talk covered a wide range and he held our interest with great slides, terrific photos, dynamic speaking and a great sense of humor. He admonished that he had "an ambitious talk with a lot of slides. If someone's going to fall asleep, just fall out of your chair and then I'll know I've talked too long." No one fell from their chair.

He first talked about 20 years of conservation efforts for the flat-tailed horned lizard (*Phrynosoma mcallii*). Eleven different state and federal agencies voluntarily came together with the goal of protecting this threatened lizard. Rob described its habitat in Southern California, Arizona and Mexico as "the lowest, hottest, driest, gnarliest desert in America outside of Death Valley." In spite of seeming to be the last place people would want to invade, 50% of the lizards' habitat has been erased by agriculture, development, and other anthropogenic pursuits. The agencies managed to establish management areas with excellent protections including continuous range-wide monitoring and ongoing research. Mexico was also included as a stakeholder. Because of these efforts, the flat-tailed horned lizard has never needed to be listed under the Endangered Species Act. Rob praised the efforts as an effective approach because of the tremendous and ongoing cooperation of the many different organizations and individuals that worked to protect the lizard. He illustrated some of the difficulties and successes of considering all the stakeholders by showing a map of the Score IV-250 off-road desert race carefully skirting the borders of a protected area. The race is tremendously popular with different agencies because of the fame and the money involved. Fast vehicles with huge horsepower push through the terrain at over 100 mph for 250 miles. The researchers anticipated the race, tagged ten lizards off the track and ten lizards on the track, and monitored the animals before, during, and after the race. Not one lizard was lost. While admitting that the sample size was small, Rob emphasized that this research had never been done before and was accomplished because of encompassing a wide variety of interested parties in efforts for the lizard.

Efforts are now underway to create similar partnerships to protect the western pond turtle, the only native freshwater turtle on the West Coast. The turtle is present on many DoD installations in California, a state where it competes for water with the human population. Rob is now participating in cooperative studies of the turtle in an attempt to replicate the success of the horned lizard project. He also covered some successful cooperative efforts that have managed to recover native habitat and animals in the channel islands off the coast of California. Impressive results allowed the island night lizard (*Xantusia riversiana*) to be removed from the Endangered Species List.

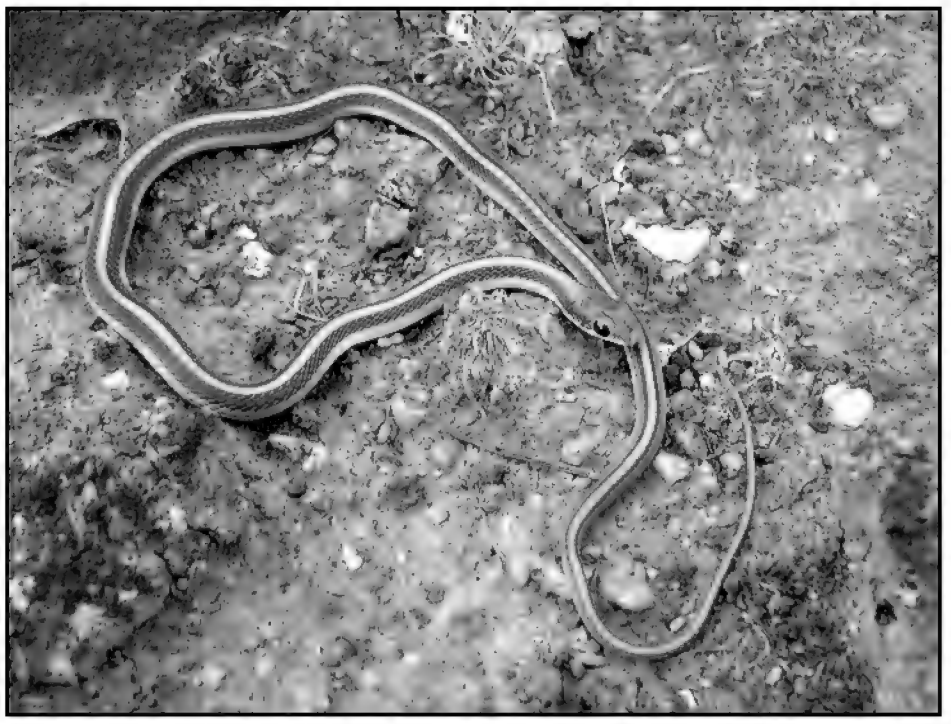
Rob stressed that conservation efforts by the DoD are driven by the needs of the military. The four services require the proper habitats and environs for training and maintaining forces that are effective in all conditions and scenarios. That means that the DoD is very concerned with keeping populations healthy so as to avoid conditions that might require extraordinary steps to protect specific animals. DoD lands have ten times more threatened and endangered species per acre than any other federal land owner. The department spends the most money on the red-cockaded woodpecker (*Leuconotopicus borealis*), but the second highest amount goes toward desert tortoises (*Gopherus* spp.). In 2009 Rob was tasked with developing a DoD strategic plan for amphibians and reptiles. In response the DoD PARC was formed. If you don't know about PARC, you need to look up that organization. Rob had been involved with national PARC and works closely with them. He formed the DoD PARC and it's grown to 400 members, mostly DoD biologists, that mimic the purpose of the national PARC. The DoD PARC's mission statement is: "In support of military readiness, DoD PARC strives to sustain amphibian and reptile populations and habitats through proactive environmental stewardship, conservation, outreach, and partnerships." They have conducted inventories, disease studies, and webinars. They have developed species fact sheets for military bases, training modules, and videos on safe venomous snake handling. In 2015 Rob was lead author on the "Strategic Plan for Amphibian and Reptile Conservation and Management on Department of Defense Lands." Endorsed by



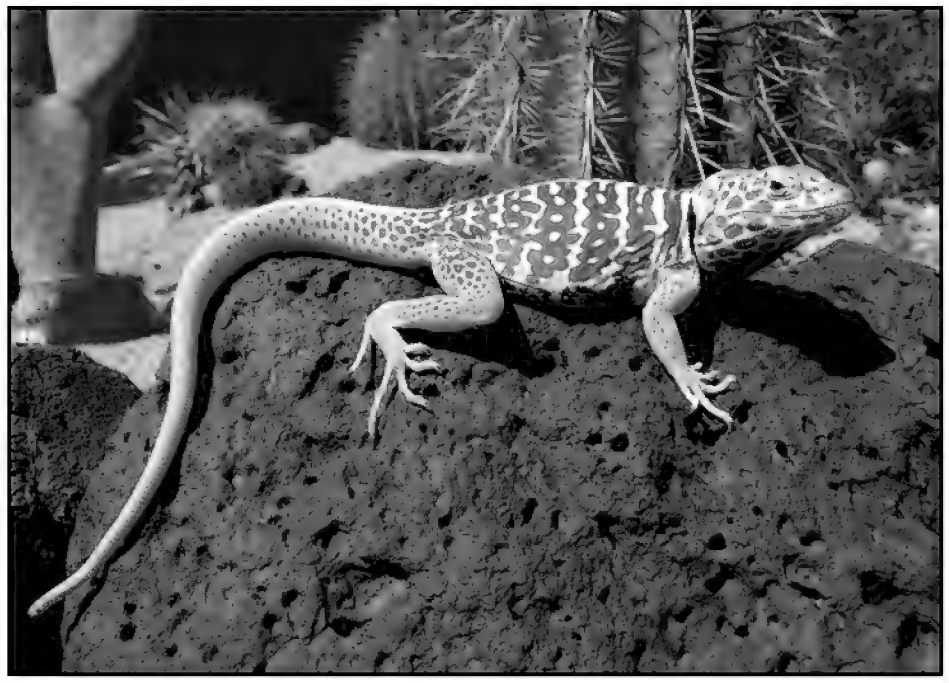
Flat-tailed horned lizard. They're really thin. "If you were going to use a horned lizard to skip it across the surface as many times as you can of a pond . . . " Photograph by Rob Lovich.

Habitat for the flat-tailed horned lizard and for high speed desert races. Photograph by Rob Lovich.

Sidewinder (*Crotalus cerastes*) enjoying the fruits of a successful flat-tailed horned lizard conservation program. Photograph by Lin Piest.



Patch-nosed snake (*Salvadora* sp.) Photograph by Rob Lovich.



Collared lizard (*Crotaphytus collaris*). Photograph by Larry L. C. Jones.

Desert iguana (*Dipsosaurus dorsalis*). Photograph by Tom Brennan.

the Assistant Secretary of Defense, the plan provides a comprehensive strategy for dealing with amphibians and reptiles on DoD lands.

Lastly Rob wanted to mention his book, *Lizards of the American Southwest*. Edited by Lawrence L.C. Jones and Rob, the book contains information on the 96 native lizards in the American Southwest. Rob spoke of how difficult it was for two government employees to publish a book that was not part of their official jobs. They overcame obstacles by enlisting multiple donors and giving all profits to the Herpetologists' League for the Jones/Lovich Grant for Southwest Herpetology. There are 67 contributors, glorious photos, and detailed accounts in a nearly 600-page book that sells for less than $25. I bought it. You should too.

I can't cover everything in Rob's talk. He obviously has many different tasks associated with his position and we had a glimpse into several of them. Rob wound up his presentation with another 40 slides of "pretty pictures of herps." A sublime ending to a great talk. Rob gave us examples of the many ways that cooperation has produced concrete results. Cooperation between agencies and individuals, herpers and nonherpers, conservationists and other land users. He mentioned how individuals can help with husbandry info and sighting reports. He said that his organization uses Herpmapper (and I think you should too.) The DoD PARC website is a gold mine of information, including photographs (free to use). Visit it and explore a little. Google the strategic plan. It's interesting to see how the DoD commits to conservation. At one point in his talk Rob mentioned that he hadn't seen himself in his current position when he was in college. I doubt most herpetologists have considered such a career path, but it's obviously a fulfilling and challenging occupation for Rob. I suspect he's the right man for the job.

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Book Review: *The Pythons of Asia and the Malay Archipelago* by David G. Barker, Mark Auliya and Tracy M. Barker 2018. 371 pp. VPI Library. Hardbound. $46.00 (available from <http://vpi.com/store>)

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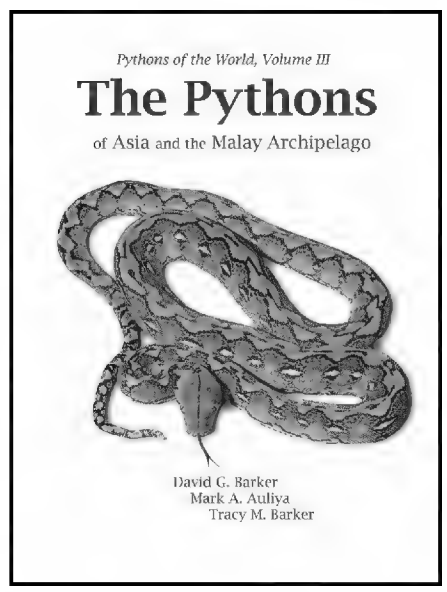
The Pythons of Asia and the Malay Archipelago is the third volume in the VPI Library's Pythons of the World series. Twenty-nine species of python inhabiting mainland Asia and the Malay Archipelago (includes Indonesia) are discussed in individual species accounts.



In the introduction the authors comment that they regard the volume as a picture book illustrating the geographic variation within each python species. Thus, most of the photos are of animals from a known geographic locality. Each photo is numbered, and its number corresponds to a number on the range map for that species or subspecies. In total, 32 species and subspecies of python are covered. The authors also establish common English names for each taxon. One of their best decisions was to use the name Lesser Sundas Python, for *Mayalyopython timoriensis*. Ever since the original description by Peters, who named it *Liasis amethystinus* var. *timoriensis* it has been referred to as the Timor Python. However, it does not occur on Timor, but on the Lesser Sundas (Flores, Komodo, and some other nearby islands).

In addition to the species accounts, the book includes a glossary, an appendix that lists the currently recognized 52 python taxa (44 species) for the planet, and a reference section. The photos are usually excellent and often show the scale arrangements that are used for identification. There is little not to like about this book.

However, if I was going to put the effort into writing a book like this, I would have expanded just a bit to include information on type localities, species, and subspecies authors, and more detailed locality maps. Instead of drawing a red line around the edge of the distribution I would have included markers for known localities. A section in each account on natural history (habits, diet, reproduction, etc.) would also greatly improve the book and make it more useful to a greater number of readers. Also, just to be picky on page 21 there is a drawing of a python with labels for gross external morphology that includes the "neck"—snakes don't have necks, or if they do they are only a couple of vertebrae long. Cervical vertebrae lack ribs, which means almost all of the vertebrae between the skull and the cloaca are thoracic vertebrae.

Python enthusiasts will find this book worth the price just for the photos.

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The Tragedy and Triumph of Jason's Den

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Several years ago, this author initiated an email discussion with a group of CHS members known to each other as "The Windies." In this email, I described a dream that I had the previous night. I was with the Windies, herping in southern Wisconsin in a place we call "The Hoggie Spot," and we were finding not only every species of herp in southern Wisconsin, but also others that are not currently possible. Cottonmouths were one of the species that we were finding, which of course is currently out of the question. The reason I use "currently" in two consecutive sentences over such a ridiculous notion as boreal Cottonmouths is because if climate change continues its course, we may very well be someday finding such southern serpents in Wisconsin! At any rate, the responses that came back from the Windies were revealing and surprising. It seems that I am not the only person in the world who dreams about herping. They all described various herping dreams, the people in them, and the cool stuff that that they were finding. How about *you*, dear readers? Do *you* ever dream about herps or herping? I would guess from the responses of the Windies that it may be a universal phenomenon with those of our bent.

Three such dreams of mine are recurrent. One, that I have not had in quite awhile, finds me board-flipping somewhere in the Southeast in what can best be described as a literal field of dreams. There is something cool under every board! The other two recurrent dreams are of very real places here in Arizona. One is Ragged Top, the other is a canyon that I have named "*Atrox* Canyon." The known aspects of both places are in these dreams, but in addition to those, new features and rock structures that are *not* actually there appear. And these new sites are *infested* with herps. Often I am with people who were dear to me who are now dead. When I awake from these dreams, I try to fall back to sleep—because I want to go back there again! I want to be in these places, with these people. It is my sincere but dubious hope that these dreams may be a sneak peek at the afterlife. Any afterlife that does *not* include herping is not worth dying for!

But there was one vivid herper's dream that was an absolute horrible experience for me. I do *not* want to have that dream ever again. In this dreadful, almost vision-like nightmare, I am with Gordon Schuett. We are radio-tracking together, and upon our approach to Atrox Den Number 1 (AD1), we find a bunch of our subjects blasted to pieces by unscrupulous hunters. They have been blown apart on the rocky apron that they all bask on, which is just outside the horizontal crevice that they overwinter in. It is a bloody, gooey mess, yet I grope into the depths of it to separate the slaughtered individuals to see if any are known to me. When one of them is recognized as "Ruth," the matriarch of AD1, I break into tears. Gordon tries to comfort me, but I am inconsolable. I try to put Ruth back together, as if by doing so, the pieces will somehow melt together and bring her back to life. But it just ain't happening. It was at this point that I woke up, and my face was sopping wet from the very real tears that had formed during the dreadful experience. And I said to myself "Thank GOD this was only a dream." Shortly after this experience, my nightmare became reality for two other people. That story now follows.

Forever Young and Jason's Den

Young Cage was the guy who first showed me Jason's Den. The reason that it is not called "Young's Den" is because Young called it "Jason's Den" right from the start. Even though Mr. Cage is dead, and the whereabouts of this Jason guy have always been unknown, the name for the den has stuck. A few words about Young Cage are in order before moving on to the meat of this missive. I first met Young in the very early going of the Y2K century. I don't remember exactly when or where I met the man, but it was likely at a meeting of the Tucson Herpetological Society (THS). At this point in his life, Young had just retired from United Airlines, where he was a Captain who piloted the big birds (747s & 777s) to Europe and back. One might think that all of the responsibilities he faced in life might make him a dour and serious sort of person. Perhaps in his professional life, he was. But his alter ego was a passionate, dyed-in-the-wool herpetologist, who morphed into a happy-go-lucky, cheerful, babbling big kid kind of guy when immersed in the field or a THS meeting. He loved herps, he loved being with herpetologists, and he was unashamed and unafraid to let that show. He faithfully served on the board of the THS, and was president for two years. About two weeks before he passed away in May of 2012, the THS honored both Young and his achievements in herpetology with a rousing tribute/roast kind of meeting. We all faced Young and sang "For he's a jolly good fellow" at the end of it all. I don't believe that *anybody* has ever been treated as royally by herpers as Young was on this evening. And I can think of nobody more deserving of the kudos than he.

The circumstances under which Young introduced me to Jason's Den were rather unusual. My wife Dianna and I were visiting Young and his wife Cheryl at their house when Young brought up the subject of the *Crotalus atrox* den that his friend Jason had shown him. He claimed that he knew a place to park that would make it less than a hundred-yard walk to get there, and that it was just *packed* with *atrox.* While neither Cheryl or Dianna are overly fond of our passion, the promise of only a hundred-yard walk—plus dinner afterward—got them to agree to do it. Thus it came to pass that on 25 February 2001 I had my first look at Jason's Den. My notes from this day are rather brief, but glad I am to have as much as I do:

2-25-01 Location: Somewhere between the North and South Pole, 4:10 to 6:20 PM
Herps: 13 plus atrox in new den
Weather: 61 degrees F, 100% clouds, 80% humidity, calm, light rain

Figure 1. Jason's Den. Image by the author.

Notes: Young Cage took me to this den, shown to him by a guy named Jason—a dove hunter. Den faces straight east, absolutely packed with snakes. Could be the best den I've ever seen. Will monitor. Young, Cheryl, Dianna

Of course, the information in my notes was a bit more revealing about the location. But this is a place that needs to be left alone as much as possible, for reasons that will follow. Without these notes, I would *not* have remembered that Jason was a dove hunter—a *responsible* dove hunter at that. He could have blasted that den to pieces, but instead, he made a mental note of its location and let it be. How Jason met Young is a mystery, but Young was no stranger to the public eye, and a very outgoing and likeable sort of guy. In any case, Jason (whose last name we will probably never know) showed Young the den. And then, Young showed me the den. And what a den it was!

There was a bit of understatement about the magnitude of Jason's Den in my notes. I should *not* have put the words "could be" in front of "the best den I've ever seen." As far as *atrox* dens go, it was and still is the best den I've ever seen. In order to save words and adjectives, I refer you to Figure 1 for an image of Jason's Den. As stated in my notes, the ovular opening/entrance faces east. And the day that I first looked into that opening, I counted 13 heads poking out of a tangled yet spread-out pile of large snake bodies. Beyond the initial entrance chamber and snake pile could be viewed the bodies of several other snakes stuffed into crevices. That is why my notes indicate "13 plus" for the count. While 13 plus is a big number, some of my other dens had that many visible at a time as well. But with these other dens, the animals were more spread out, and stuffed deep into crevices. One might see two or three tangled together a meter deep here and there over a comparatively broad expanse of rock structure. None of my other dens had the view of whole, large rattlesnakes coiled amongst each other that Jason's Den afforded. Lengthy and multi-segmented rattles capping sizeable, vibrant white-and-black-banded male *atrox* tails were all in the "wide-open," as were the *hefty* silver-gray bodies and heads of 13 ***dandies*** packed into a refrigerator-sized area. Jason's Den was part gash den and part crevice den. Unlike other gash dens, there was no packrat wall to block the incredible view. But behind and above the snake-infested gash (upper right corner to the person looking in) were a series of tight-running crevices. Packed in those cracks, behind the big boys, was the harem of

Figure 2. A look inside of Jason's Den, spring 2001. The snakes packed in the right corner of the den are all obviously males, who block the entrance to the tight crevice behind them. The females tended to overwinter behind these males, and were not often visible. Image by Young Cage.

females that the boys were watching intently.

One detail about Young Cage thus far not mentioned is that he was also a *fantastic* nature photographer. At that point in time, my own photography was also not bad, but Young Cage I was *never*. But in this case, the skill level doesn't matter because neither of us had our cameras with us. I lament that fact to this very day.

I had three other chances to get the money shot of a packed Jason's Den that year. But with each visit, there were snakes outside the entrance hole, and I wanted to be very careful not to spook the subjects of this new den. I was also convinced that Young was photographing the inside of the den, and there was no point in both of us risking scaring the snakes off by duplicate effort. The lesson learned is a harsh one. *Never* let the opportunity to get the money shot slip by without taking it. Figure 2 is a Young Cage image that reveals the inside of Jason's Den as it was in the spring of 2001. The exact date is unknown, and the quality of the image is not at all up to Young's usual standards. But it is all we have. My last visit to Jason's Den in 2001 occurred on 19 March. On that day, four *atrox* were viewed just outside the entrance of the den, and two others were in courtship on the top of the massive exfoliated rock structure of Jason's Den, roughly four meters above it. By that point in time, the Suizo Mountain Study had begun, and there was little time for anything else. It was to be nearly eight years before I returned to Jason's Den.

The future cofounders of ASP get involved

Melissa Amarello and Jeff Smith first got wind of Jason's Den through Young at a social gathering. When they expressed interest in going, Young took them there. Their first visit was on 21 March 2004, but there was not much going on as egress had already occurred. Melissa and Jeff had the entire spring and summer to think about the den, and decided they would like to do some observational research there. In the fall of 2004, the four of us (Young, Melissa, Jeff and me) met at a local pub to discuss the possibility of a hands-off study at Jason's Den. Young was invited to this gathering by Melissa and Jeff because

Figure 3. Melissa Amarello and Jeff Smith observing the den, 19 November 2004. Image by Young Cage.

it was the proper and respectful thing to do. With Jason being out of the picture by his status of "whereabouts unknown," the unwritten law of Arizona Herper etiquette clearly made Young the guardian of Jason's Den. I was invited to this meeting because of my previous experience with hands-off monitoring of *atrox* dens in other places. The upshot of this gathering was that Melissa and Jeff were going to take my method of hands-off study to new limits. They would only watch the den from a distance by using binoculars, and use cameras with telephoto lenses to compare, identify and monitor individuals based on any unique patterns they could discover. By the end of the meeting, Young gave his blessing to the young couple to proceed.

It is not the purpose of this article to recount exact dates of everything the dynamic duo did and saw during their brief association with Jason's Den. As I did not go there with them, exact dates are not possible for me. I know that the two of them were out there on or around 13 November 2004. Young Cage went with them on 19 November 2004. I was invited for that one, but the work thing got in the way of the more important things in life. Figure 3 shows Melissa and Jeff peering inside the den on this day. The emails that were circulated indicated that everybody was happy and thrilled with what they were seeing thus far.

While I may be uncertain about the exact dates of everything going on at Jason's Den, I am fully aware of the day the music died. On 25 November 2004, Thanksgiving Day, Melissa and Jeff headed out in high spirits to see what was developing with the den. From over 20 meters away, they could see that something wasn't quite right there. With every step forward, things got worse, as did the overwhelming feeling of dread and doom. Many spent shotgun shells were viewed scattered in helter-skelter fashion on the apron of the den. A long stick was viewed pointing into the den, and several rocks had been moved aside (Figure 4). A headless adult *atrox* was found next, (Figure 5), and at the same time, a rattle sounded off from inside the den. Upon moving up to the entrance and peering inside, the full-blown horror story/living nightmare began. Large chunks of bodies blasted into pieces were viewed and photographed. Flies had settled in all around the entrance, and the stench of death was overwhelming. Amongst the body parts, a smallish and likely terrified female *atrox* rattled in angst. In order to compare

Figure 4. Tragedy at Jason's Den. "With every step forward, things got worse, as did the overwhelming feeling of dread and doom. Many spent shotgun shells were viewed scattered in helter-skelter fashion on the apron of the den." Image by Melissa Amarello and Jeff Smith, cofounders of Advocates for Snake Preservation (ASP).

hell with paradise, see the two images in Figure 6. One week previous, Melissa and Jeff had been viewing close to a dozen rattlesnakes living peacefully together in a remote spot on planet earth. And now they were viewing the cruel desolation and decimation of a priceless patch of real estate. The scene was reminiscent of the very bad "what's worse than a truckload of dead babies" joke.

Those of us who love these creatures can only imagine the tears, the frustration, and the helpless rage experienced during

Figure 5. Headless *Crotalus atrox*, unceremoniously butchered outside the den. Image by ASP, 25 November 2004.

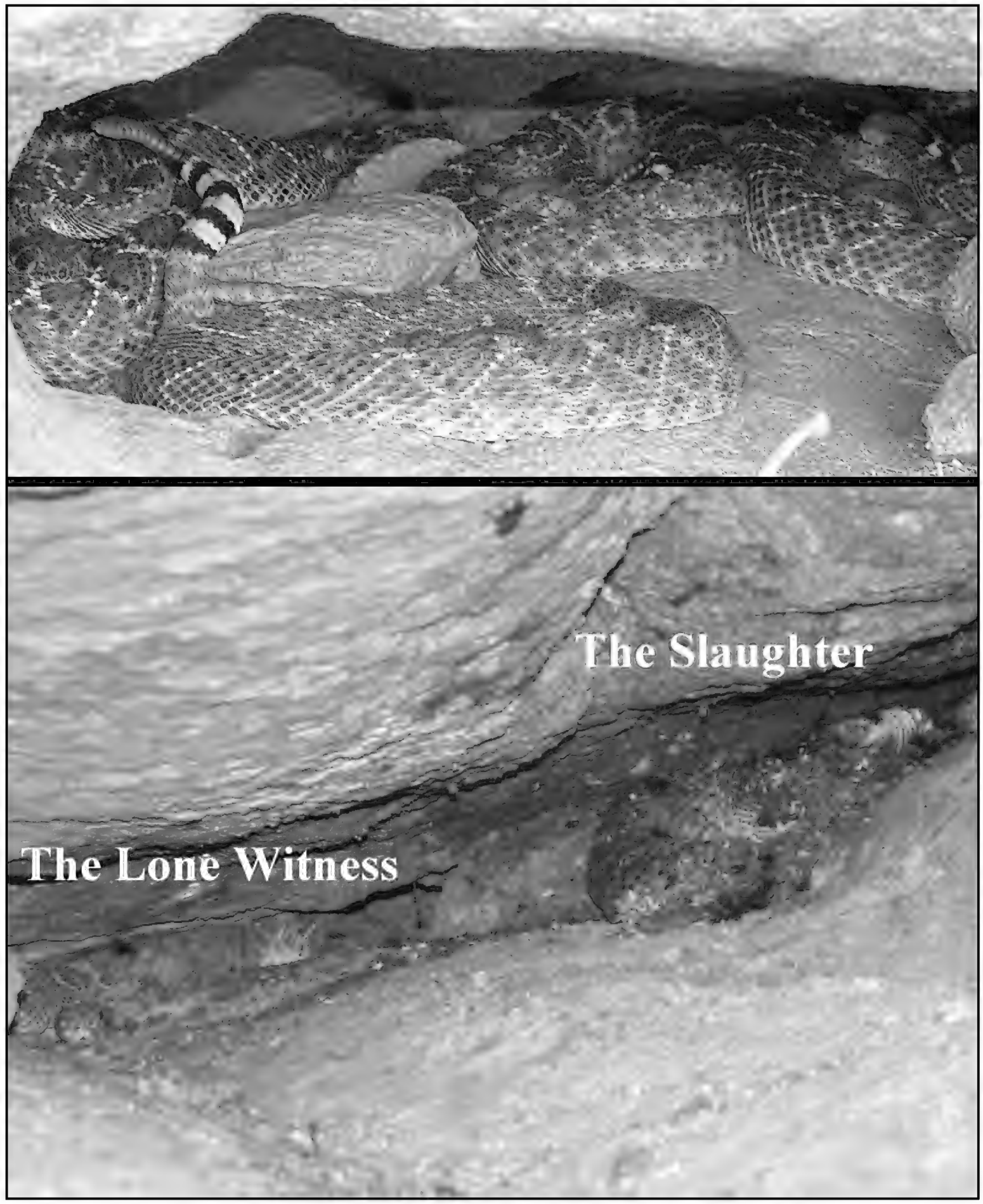


Figure 6. (**Top**) The inside of Jason's Den as it was on 13 November 2004. (**Bottom**) Tragedy on 25 November 2004. In the words of ASP: "A female coiled slowly at the rear of the opening chamber, peering at us while she rattled vigorously. Next to her, large pieces of scaly flesh blocked a crevice by which snakes once moved out of sight into the rocks." Imagine the stench, note the flies, and witness the desolation of a senseless hate crime against nature. Images by ASP.

the cleanup operation that followed. It was obvious what happened. One or more hunters, armed with shotguns, found the den. At point blank range, the "sportsmen" blasted away inside the den. They likely used the long stick left at the entrance to move some of the slaughtered snakes out of the way so that they could get at the rest. The surviving female was probably behind the big snakes, tucked safely out of sight when the massacre occurred. She was the lone witness to the horror of it all. Further investigation led the couple to even more grisly evidence of the wanton blood lust that had transpired. Badly-mangled snake heads were found smeared and dried against the granitic boulders nearby. Four more sections of snake bodies were found scattered under the bushes nearby. Large bird droppings attested to the feast of the vultures that followed. The worst part of all of this is that there was probably nothing illegal about what happened here. Hunting regulations allow for the killing of up to four of any species of rattlesnake per year per individual, provided that individual has a hunting license. If there were three hunters involved in this senseless act, everything was okay here with the State of Arizona. Regardless of the legalities, this was a shameful and gutless act—one that violates the creed and ethics of the sport of hunting. The number one rule that all who hunt are taught to follow is that one *never* kills what one does not intend to eat. This was in plain and simple terms an awful and mean-spirited hate crime against nature.

The emails that followed this event were hard to take. Then, there was some good news to come from it all a few days later. Under the subject matter of "You can't keep a good den down," the pair reported that a few more *atrox* had appeared at the den.

Figure 7. (**Left**) The triumph! Jason's Den as it appeared on 9 December 2013. (**Right**) And again on 1 January 2016. See text for details of these and all other images. Images by ASP (left), and Marty Feldner (right).

And then, nearly as quickly as this good news was received, the hunters returned to finish these off as well. On 29 November 2004, Melissa and Jeff visited the den and found total carnage again. It appeared that Jason's Den was out of our lives for good. As for Melissa and Jeff, there can be little doubt that the horror they witnessed here was an inspiration for the eventual formation of their organization "Advocates for Snake Preservation" (ASP).

It eventually came to pass that the parking spot that got one close to Jason's Den was gated off and became a closed community. The fast, easy way to Jason's Den was no longer an option. It was the best thing that could have happened to it. On February 15 of 2009, Young Cage was keen to try to find a backroads way to Jason's Den for a checkup. Neither of us had been there since the slaughter. Some serious flandickery occurred as we tried various ways to get Young's Nissan X-Terra close to the den, but we eventually figured it out. We were mildly pleased to note that there was a smallish male *atrox* coiled in front of the far right corner of the den, with a bit of flank of yet another *atrox*, hopefully a female, tucked in behind him. That was two more *atrox* than we expected here, and better than nothing it was. I was still not convinced that the den would ever reach its former glory, and found other places to go for the next seven years.

Unbeknownst to me, Melissa and Jeff visited the den on 19 December 2013, and what they saw is shown in Figure 7. Things were improving at Jason's Den, but I had no way of knowing this. The creators of ASP are a rather secretive pair, and there was never a reason for them to take me into their confidence with every little thing that they did. It was not until I was dragged there (practically kicking and screaming) on 1 January 2016 by John Slone (to whom Young had also shown the den) and Marty Feldner that I noted that it was getting better all the time (Figure 7). My last visit to Jason's Den was in March of 2018. We saw enough there to see that the place is worthy of the occasional return trip.

Many aggregate *atrox* dens that were once reliable and dependable have passed out of existence before my very eyes. With some of these, research on the snakes might be responsible for driving them off. But with others, the snakes were never touched by human hands, and were treated with the same respectful methods that Melissa and Jeff used at Jason's Den. It's my opinion that climate change is hugely responsible for what we are seeing. Whether these dens no longer exist because of research or drought, *none of* these empty cracks or gashes ever went through what Jason's Den did. It is a testimony and tribute to this hallowed patch of ground, and the snakes within, not only to have survived such an ordeal, but to triumph and thrive in spite of it.

This here is Roger Repp, signing off from Southern Arizona, where the turtles are strong, the snakes are handsome, and the lizards are all above average.

Acknowledgments

None of this could have ever been documented without the "mystery man" Jason. Wherever you are sir—thank you! We are grateful to Young Cage for many reasons. There will never be anybody like him again. Matt Cage came through with some of the images in this article, and continues to enthusiastically carry the herpetological torch for his father. Without John Slone and Marty Feldner bullyragging on me, I never would have gone back to see Jason's Den again. Lastly, a heartfelt acknowledgement to Melissa Amarello and Jeff Smith is in order for their tireless efforts in reaching out to the public to cast *all* snakes in a favorable light. They are taking the fight where nobody else goes, and are reaching thousands with their message. The author invites the reader to type "Advocates for Snake Preservation" into their favorite search engine, and see what comes up. Know that what you see when you do is that *everything* that this dynamic team does mimics their motto of "for the snakes."

Minutes of the CHS Board Meeting, May 18, 2018

Rich Crowley called the meeting to order at 8:09 P.M. Board members Dan Bavirsha, Lawrence Huddleston, Kim Klisiak, Tom Mikosz and Jessica Wadleigh were absent. Minutes of the April 20 board meeting were read and accepted with changes.

Officers' Reports

Treasurer: John Archer presented the financial reports for April.

Media secretary: Kim Klisiak (via email) suggested two possible options (GoDaddy.com and HostGator.com) to serve as a new host for the CHS websites. The board favored HostGator. This will host all three CHS sites (CHS, Junior Herpers and ReptileFest). Kim has the board's approval to go forward.

Membership secretary: Mike Dloogatch read the list of expiring memberships.

Sergeant-at-arms: Mike Scott reported 30 people in attendance at the April 25 general meeting.

Committee Reports

Library: We are having an issue with storage in the Notebaert. We may need to move the library carts off site. Several cartons of books have already been moved to our rented storage facility. We need some people to go through those cartons and determine what should be retained and what should be discarded.

Old Business

As it stands we will not have liability insurance after the current policy expires on May 31. Shows will need to be placed on hold until we obtain new coverage.

New Business

Rich Crowley reported that the Pet Industry Joint Advisory Council is looking for representation from regional herp societies at a workshop to be held October 31 – November 1 in Maryland.

Bob Bavirsha needs a few members to help clean up and organize the storage unit, including emptying the trailer so that it can be sold.

The meeting adjourned at 10:25 P.M.

Respectfully submitted by recording secretary Gail Oomens

In Memoriam: Philip William Drajeske

Phil Drajeske died at the age of 84 on May 19, 2018. He is survived by his wife Diane and sons David and Mark. He was an accomplished chemical engineer (with a degree from the University of Wisconsin), and a pioneer in computer-based management information systems (at the Joliet Exxon/Mobil refinery). Phil joined the Chicago Herpetological Society in the late 1960s. He served on the board of directors from 1971 through 1990 in various capacities, including multiple terms as treasurer, recording secretary and sergeant-at-arms. Phil was a turtle person, and his specialty was South American sidenecks. He achieved no small amount of fame as a herpetoculturist long before there was such a word. He was one of the very first to successfully breed and hatch out mata mata turtles in captivity. Until shortly before his death, Phil regularly attended CHS meetings and special events. For many years the large, portable fiberglass enclosure he built to display his sidenecks was a highlight at CHS shopping mall shows and ReptileFest. He will be missed by many.

Advertisements

For sale: **highest quality frozen rodents**. I have been raising rodents for over 30 years and can supply you with the highest quality mice available in the U.S. These are always exceptionally clean and healthy with no urine odor or mixed in bedding. I feed these to my own reptile collection exclusively and so make sure they are the best available. All rodents are produced from my personal breeding colony and are fed exceptional high protein, low fat rodent diets; no dog food is ever used. Additionally, all mice are flash frozen and are separate in the bag, not frozen together. I also have ultra low shipping prices to most areas of the U.S. and can beat others shipping prices considerably. I specialize in the smaller mice sizes and currently have the following four sizes available: Small pink mice (1 day old—1 gm) , $25 /100; Large pink mice (4 to 5 days old—2 to 3 gm), $27.50 /100; Small fuzzy mice (7 to 8 days old—5 to 6 gm) , $30/100; Large fuzzy mice / hoppers (10 to 12 days old—8 to 10 gm), $35/100 Contact Kelly Haller at 785-234-3358 or by e-mail at kelhal56@hotmail.com

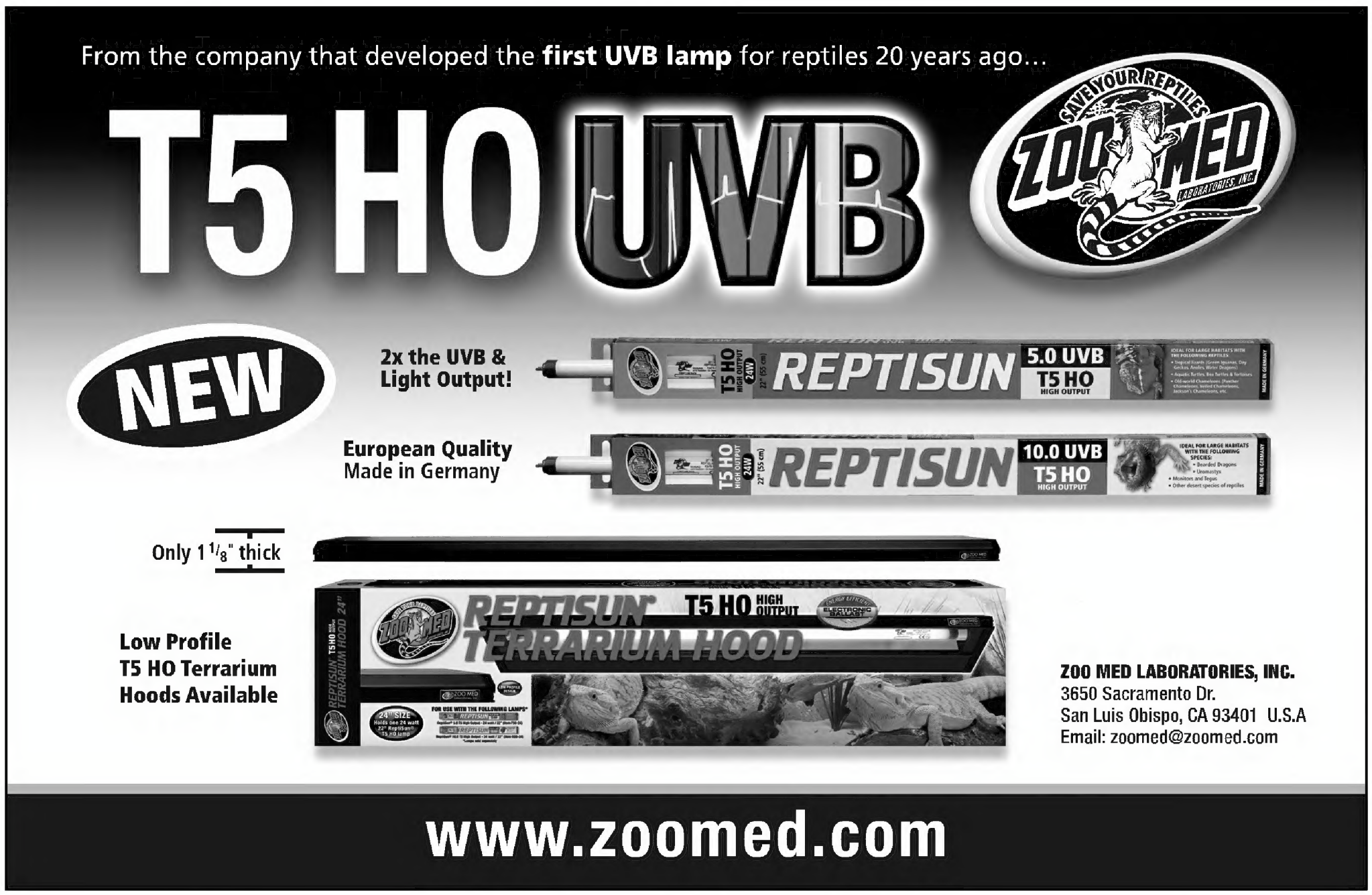
For sale or trade: Probable pair of albino Harquahala rosy boas. They were born in my home in late 2016 and are feeding on f/t peach fuzz mice. Pure locality animals exhibiting a recessive gene. Viewing is possible, parents on site. I can drive to meet a reasonable distance, or ship if you are not local. Discount if you pick them up from my home. Cash, credit card or PayPal. Call or text 510-318-1715, or email elenabmoss@gmail.com.

Herp tours: **Costa Rica herping adventures**. Join a small group of fellow herpers for 7 herp-filled days. We find all types of herps, mammals, birds and insects, but our target is snakes. We average 52 per trip, and this is our 10th year doing it. If you would like to enjoy finding herps in the wild and sleep in a bed at night with air-conditioning, hot water and only unpack your suitcase once, instead of daily, then this is the place to do it. Go to our web-site http:// hiss-n-things.com and read the highlights of our trips. Read the statistics of each trip and visit the link showing photos of the 40 different species we have found along the way. E-mail at jim.kavney@gmail.com or call Jim Kavney, 305-664-2881.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to mdloogatch@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Christopher Foster
Elisa Graczyk
Courtney Kloeckner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San Luis Obispo, CA 93401 U.S.A
Email: zoomed@zoomed.com
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UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, June 27, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Neither age (yours) nor commonness (the animal's) should be a limitation.

The speaker for the July 25 meeting has not yet been confirmed.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

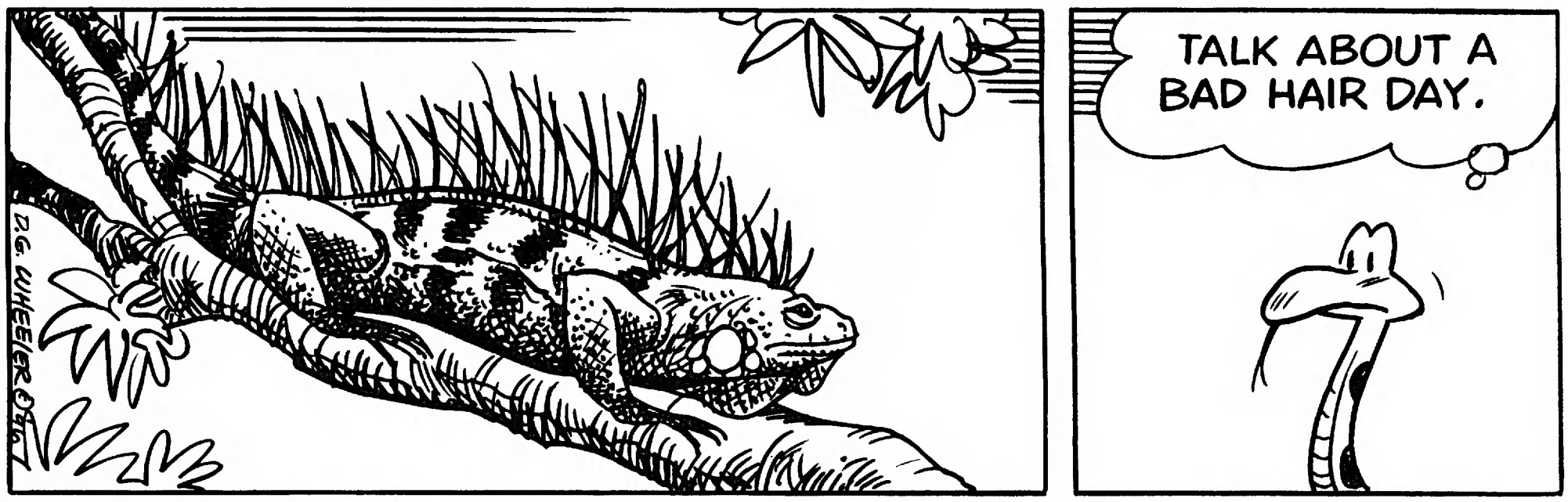
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to take place on July 13, 2018. The venue is as yet uncertain, so if you wish to attend please email mdloogatch@chicagoherp.org.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the group's Facebook page.

THE ADVENTURES OF SPOT



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